Estudos de Economia, vol. II, n.º 3, Abr.-Jun., 1982

SOURCES OF OUTPUT GROWTH IN THE PORTUGUESE ECONOMY (1959-1974) (*)

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1 — Introduction

This paper reports the results of an input-output analysis of the sources of growth in the Portuguese economy in 1959-1974, using the Torii-Fukasaku methodology. Other papers will report research on the same topic using alternative methodologies and extending the problems investigated into the value added and employment areas.

The plan of the paper is as follows: section 2 registers the Torii-Fukasaku method of measurement; section 3 provides a simple over-view of results to the economy as a whole; section 4 details findings for each of the three subperiods 1959-1964, 1964-1970 and 1970-1974; section 5 comments the results of a decomposition of final demand changes in three categories: private consumption, Government consumption and investment; section 6 closes the report with a set of conclusions.

2 — Methodology

The methodology used in this study has been developped by Torii and Fukasaku (1).

Let it be:

ΔX — Incremental output vector;

A — Technical coefficients matrix;

M_m — Intermediate import vector;

M_f — Final import vector;

F_d — Domestic final demand vector;

$\wedge$ — Symbol of diagonal matrix.

(*) Special thanks are due to Manuela Santa Maria, under whose directions the I-O tables have been prepared, and to T. Teixeira, who programmed and run the computations.

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(1) Y. Torii and K. Fukasaku, «Economic Development and Changes in Linkage Structure: an Input-Output Analysis of Korea and Japan», Seventh International Conference on I-O techniques, Vienna, April 1979.

From:

(1) $$X = AX - M_m + F_d - M_f + E$$

(2) $$M_m = \hat{M}_m \, AX$$

(3) $$M_f = \hat{M}_f \, F_d$$

we have:

$$X = \left[I - (I - M_m)\, A\right]^{-1} \left[(I - \hat{M}_f)\, F_d + E\right] = BG$$

where B is the Leontief inverse and G the exogeneous demand vector for domestic output.

(4) $$\Delta X = X^1 - X^0 = B^1 G^1 - B^0 G^0 = B^1 \ \Delta G + \Delta B \, G^0$$

Denoting by B^* and G^* the following matrix and vector:

(5) $$B^* = \left[I - (I - \hat{M}_m^0)\, A^1\right]^{-1}$$

(6) $$G^* = \left[(I - \hat{M}_f^0)\, F_d{}^1 + E^1\right]$$

and writing:

(7) $$\Delta B = B^1 - B^0 = (B^1 - B^*) + (B^* - B^0)$$

(8) $$\Delta G = G^1 - G^0 = (G^1 - G^*) + (G^* - G^0)$$

we see that ΔX can be decomposed as follows:

$$\begin{aligned}
\Delta X = {} & B^1 \, (I - \hat{M}_f{}^0) \, (F_d{}^1 - F_d{}^0) \\
& + B^1 \, (E^1 - E^0) \\
& + B^1 \left[(I - \hat{M}_f{}^1) - (I - \hat{M}_f{}^0)\right] F_d{}^1 \\
& + (B^1 - B^*) \left[(I - \hat{M}_f{}^0) \, F_d{}^0 + E^0\right] \\
& + (B^* - B) \left[(I - \hat{M}_f{}^0) \, F_d{}^0 + E^0)\right]
\end{aligned}$$

Each of these terms measures the effects of a particular source of growth:

a) The first term, the effects of changes in domestic final demand;
b) The second term, the effects of changes in exports;
c) The third term, the effects of changes in final import coefficients;
d) The fourth term, the effects of changes in intermediate import coefficients;
e) The fifth term, the effects of changes in technical coefficients.

This is not the only possible decomposition of the incremental output vector.

Firstly, we can find in the literature other approaches. Secondly, even if we only consider the approach expressed in (4), we can depart from the Torii-Fukasaku solution and find a different way of decomposing ΔX. These issues will be dealt with in other papers. At this stage it suffices to note that we may rearrange the second member of (4) as follows:

$$(9) \quad B^1 \Delta G + \Delta B G^0 = (B^0 + \Delta B) \Delta G + \Delta B G^0 = B^0 \Delta G + \Delta B G^1$$

In the first member, the second term, $\Delta B G^0$, computes the effect of changing technology from B^1 to B^0 holding final demand constant at the G^0 level, while the first term, $B^1 \Delta G$, computes the effect of changing final demand from G^1 to G^0 holding technology constant at the new position B^1. Comparing with the second member, we can see that the first term, $B^0 \Delta G$, takes the effect of final demand change ΔG assuming that technology is held at the B^0 position and, then, computes the effect of changing technology to B^1 assuming final demand at the G^1 level.

Of course, the two solutions will lead to different results. In this paper I shall stick to the decomposition expressed in (4).

3 — **Output changes in 1959-1974: an over-view**

The decade and a half that runs from 1959 to 1974 has seen remarkable changes in the Portuguese output structure. For 1959, 1964, 1970 and 1974, for each of these years, we have an I-O table in current prices, as compatible as possible, prepared by Manuela Santa Maria and collaborators (2).

Applying the preceding methodology we get the following broad picture of the sources of changes in output growth.

TABLE I

Sources of total output growth in the economy (1959-1974)

Percentage

	1959-1964	1964-1970	1970-1974
Final demand	85.1	70.8	94.2
Exports	17.2	20.8	22.5
Import substitution	0.9	0.7	— 11.3
Final imports	2.0	— 0.8	— 6.6
Intermediate imports	— 1.1	1.5	— 4.7
Technical coefficients	— 3.2	7.7	— 5.4
Total	100	100	100

(2) The tables should be expressed in constant prices. However, at this stage such tables are not available. Manuela Santa Maria and collaborators prepared the compatible set of 20 x 20 I-O tables out of the INII tables for 1959 and 1964 and of the GEBEI tables for 1970 and 1974. This set is being prepared for publication.

By far, the most important source accounting for output growth in the economy in the period 1959-1974 was final demand. Its share in 1970-1974 attained 94 %. In the two previous subperiods, it has been 71 % in 1964-1970 and 85 % in 1959-1964. Exports were the next important source, rising regularly from 17 % in 1959-1964 to 22.5 % in 1974, a clear signal of the growing openness of the Portuguese economy.

Another relevant signal pointing in the same direction can be read in the import substitution results. Overall, import substitution has been a very secondary factor, although positive, in 1959-1964 and 1964-1970. In each of these subperiods total relative import substitution effects have represented less than 1 % of output growth. Decomposing further import substitution, in final and intermediate uses, we can see that rather small contributions, around 1 % or 2 %, with different signs in different subperiods, were involved. This situation has dramatically changed in the early 70's. Then, total import substitution played a non-negligible role, and a negative one, for that matter, representing — 11.3 % of total growth. Final import substitution alone accounted for — 6.6 %, the remaining — 4.7 % being earmarked to changes in intermediate import coefficients.

4 — **Patterns of changes in the various subperiods**

The analysis of the different subperiods will take in turn effects centered on final demand, exports, import substitution and technical change, as measured by change in the input-output coefficients. For each of these sources of output changes two types of developments will be examined. First, the relative contribution of the effect to sectoral output growth, noting the most striking features at sectoral level. Second, the sectoral shares relative to the total for the economy shown by the particular effect under study, noting again the most important sectoral features under this approach.

4.1 — **1959-1964**

Table II confirms the overwhelming importance of final demand effects for all branches in this subperiod. Pulp and paper is the single branch where final demand effects are exceeded by some other type of changes, exports, in the case.

Grouping the various industries according to the relative levels of final demand effects, one must specially note those which show levels higher than 100 %: agriculture and fishing, mining, petroleum and coal, shipbuilding, miscellaneous manufacturing and transportation and communications.

TABLE II

Sources of output growth (1959-1964) (*)

Percentage

Sectors	*FD*	*E*	*M*	*MF*	*MM*	*A*
1 Agriculture and fishing	108	35	— 19	— 8	— 10	— 24
2 Mining	317	21	— 429	— 483	54	0
3 Food, beverages and tobacco	90	— 3	4	— 1	5	9
4 Textiles	70	46	— 5	0	— 5	— 11
5 Apparel, shoe and leather	69	29	4	3	1	— 2
6 Wood, cork and furniture	80	39	1	0	0	— 20
7 Pulp and paper	34	38	23	22	1	3
8 Chemicals	67	37	— 3	— 7	4	— 1
9 Petroleum and coal	107	— 8	18	17	— 1	— 14
10 Non-metalic mineral products	99	17	8	8	0	— 23
11 Basic metallurgy	63	20	33	11	22	— 17
12 Metalworking	68	11	39	49	— 9	— 18
13 Shipbuilding and repair	746	— 66	— 204	3	— 207	— 376
14 Miscellaneous manufacturing	259	41	— 39	— 35	— 3	— 161
15 Electricity, water and gaz	76	11	0	0	0	11
16 Construction	98	0	0	0	0	1
17 Trade	67	11	— 12	1	0	22
18 Transportation and communications	58	35	1	0	— 12	19
19 Other services	104	0	0	1	0	5
20 Government	100	0	0	0	0	0

(*) Apart from rounding errors, $FD + E + M + A = 100\ \%$.

FD — Final demand effects.
E — Exports.
M — Total import substitution effects ($M = MF + MM$).
MF — Final import substitution effects.
MM — Intermediate import substitution effects.
A — Technical coefficients.

It should also be mentioned a second group of industries which benefited from final demand impulses to the point of recording higher than average relative levels. This is the case of food, beverages and tobacco, non-metallic mineral products and construction.

As already stated final demand effects amounted to 85 % of total output growth in the economy in this subperiod. According to table III, the sectors that have contributed more to such an achievement are listed below, figures in brackets representing their share in output growth attributed to final demand. It did not take more than three sectors to reach a 40 % share of total final demand effects. Those sectors are the following: food, beverages and tobacco (14.8 %), trade (13.0 %) and construction (12.2 %). Next, we find agriculture and fishing (10.7 %), other services (8.9 %), Government (7.1 %), textiles (6.1 %) and metalworking (6.1 %).

The above mentioned pattern matches closely what one could expect in a country approaching the semi-industrialized stage after a decade and a half of an industrialization spurt, in the beginning very much centered in the domestic market, followed by a selective export drive.

Although the role of exports was still modest at that time, for a few sectors it was already a growth factor of some importance. The industries that benefited most, predictably enough, were natural resources based or light labour intensive manufacturing, with two exceptions. Thus, mining, agriculture and fishing, textiles, wood, cork and furniture, apparel, pulp and paper and miscellaneous manufacturing were naturally found among the front runners. Chemicals and transportation and communications were also included in that same group. According to table II, in all those sectors exports accouted for more than 1/3 of output growth.

In two cases, petroleum and food and beverages and tobacco, the export effect has been mildly negative. In a single case, shipbuilding, it has been strongly negative.

TABLE III

Sectoral shares in output growth effects (1959-1964) (*)

Percentage

Sectors	*FD*	*E*	*M*	*MF*	*MM*	*A*
1 Agriculture and fishing	10.7	17.2	— 188.9	35.5	80.8	64.3
2 Mining	1.4	4.6	— 185.5	— 90.1	— 17.7	0.0
3 Food, beverages and tobacco	14.8	— 2.6	62.1	— 11.1	— 66.6	— 42.1
4 Textiles	6.1	19.8	— 45.5	— 0.3	34.0	26.1
5 Apparel, shoe and leather	4.1	8.5	25.4	8.2	— 4.8	3.1
6 Wood, cork and furniture	2.5	6.0	— 1.3	1.1	1.0	16.7
7 Pulp and paper	0.8	4.3	52.3	21.6	— 1.7	— 2.3
8 Chemicals	3.4	9.4	— 16.6	— 15.8	— 15.2	1.7
9 Petroleum and coal	— 0.8	0.3	— 12.3	— 5.8	— 0.9	— 3.1
10 Non-metalic mineral products	2.8	2.4	21.3	10.3	1.8	17.6
11 Basic metallurgy	2.2	3.6	117.1	17.3	— 58.4	16.4
12 Metalworking	6.1	5.0	350.9	188.6	65.4	44.4
13 Shipbuilding and repair	0.6	— 0.3	— 17.5	0.1	13.4	8.7
14 Miscellaneous manufacturing	1.1	0.9	1.6	— 6.3	1.2	18.1
15 Electricity, water and gaz	2.0	1.5	0.0	0.4	— 0.7	— 8.1
16 Construction	12.2	0.2	10.9	0.2	0.3	— 5.0
17 Trade	13.0	10.6	— 69.6	12.2	13.3	— 114.5
18 Transportation and communications	3.4	10.1	8.8	0.4	53.6	— 30.3
19 Other services	8.9	0.3	0.0	4.4	1.1	12.8
20 Government	7.1	0.0	0.0	0.0	0.0	0.0

(*) Column elements do not sum up to 100 % due to the existence of a residual sector imposed by the need to make the 1959 and 1964 tables as compatible as possible with those for 1970 and 1974.

FD — Final demand effects.
E — Exports.
M — Total import substitution effects.
MF — Final import substitution effects.
MM — Intermediate import substitution effects.
A — Technical coefficients.

Regarding the main contributors to total export growth, table III points to two sectors far apart from the others, that is, textiles (19.8 %) and agriculture ans fishing (17.2 %). This is in perfect agreement with the Portuguese entrepreneurs reaction to the new prospects opened up by the EFTA agreement.

We turn now to import substitution effects.

Over the whole economy, total import substitution effects have been negligible. However, at sectoral level one cannot help to be impressed by significant movements in opposite directions and, thus, offsetting each other.

Concerning relative contributions of IS effects to sectoral growth, in a few cases there has been a pronounced positive effect. This happened in metalworking (39.2 %), in basic metallurgy (33.4 %) in pulp and paper (23.3 %) and in petroleum and coal (15.6 %).

In general terms, these developments are easily explained by the industrialization policy followed in the 50's and early 60's, particularly by means of State support to capital intensive IS substitution projects. The first and second Planos de Fomento are there to prove the assertion, with the inclusion of investments in oil refinery, stteel and pulp facilities. At the same time, State coordinated linkages with the development of heavy metalworking fabrication and support to smaller firms in the very incipient metalworking industry explain the importance of the IS effect in metalworking.

Next to this first lot, we also find positive import substitution in non-metalic mineral products (7.7 %), though at a much lower level.

In general, for most sectors IS effects in final demand have been higher than in intermediate demand, the obvious exception being basic metallurgy.

Negative IS has been most relevant in agriculture and fishing (— 19.3 %), in mining (— 429.4 %), shipbuilding and repair (— 203.9 %). The first sector has almost always been at the root of a persistent foreign exchange drag. Overall, at the economy level, the interesting point is that in the early 60's the import substitution phase had already passed its peak and a clear reversal in trends was already visible in important sectors.

Reading table III, it is clear that a very high share of IS effects in final use occurred in metalworking (188.6 %), while the significant negative shares in the same effect are to be atributed to mining (— 90.1 %) and agriculture and fishing (— 35.5 %). Relative to intermediate IS, agriculture (80.8 %), metalworking (65.4 %) and trade (33.6 %) are the main positive contributors and food, beverages and tobacco (— 66.6 %) and basic metallurgy (— 58.4 %) are their counterparts on the negative side. However, these developments are of little significance, given the negligible size of total IS effects.

Changes in technical coeficients had very negative effects in shipbuilding and repair (— 376.1 %) and miscellaneous (— 161.2 %) and

significantly negative (around — 20 %) in several important branches. Positive changes of the last order of magnitude occurred in services and infra-structures. Of course, we must appraise in favourable terms technical changes which save inputs and, thus, lead to a decrease in intermediate demand.

Considering the relative levels of the different effects in mining, we must remember that the absolute output increment is fairly small and results from movements in opposed directions, according to the type of effect. This explains their high percentual representation relative to total effect. This fact has to be keptin mind along this paper.

4.2 — **1964-1970**

In the second half of the 60's, final demand impulses for agriculture and manufacturing outputs lost part of their relative strength. However, they have consolidated their position in construction and services sectors, as can be seen in table IV.

TABLE IV

Sources of output growth (1964-1970) (*)

Percentage

Sectors	*FD*	*E*	*M*	*MF*	*MM*	*A*
1 Agriculture and fishing	66	21	5	1	— 4	7
2 Mining	— 686	434	374	507	— 133	— 21
3 Food, beverages and tobacco	68	21	— 1	3	— 5	11
4 Textiles	— 18	75	6	— 4	9	38
5 Apparel, shoe and leather	78	24	— 3	— 2	— 1	1
6 Wood, cork and furniture	72	55	— 8	— 6	— 2	— 19
7 Pulp and paper	20	69	— 6	— 6	17	8
8 Chemicals	65	34	8	— 15	8	8
9 Petroleum and coal	42	55	— 3	— 4	12	— 5
10 Non-metalic mineral products	46	26	18	— 4	1	31
11 Basic metallurgy	62	38	2	26	— 7	— 18
12 Metalworking	64	24	— 12	— 2	4	10
13 Shipbuilding and repair	41	71	— 8	— 21	10	0
14 Miscellaneous manufacturing	57	27	1	— 9	1	24
15 Electricity, water and gaz	65	16	0	0	1	18
16 Construction	104	0	— 2	0	0	4
17 Trade	148	— 12	— 2	— 3	6	— 38
18 Transportation and communications	101	3	0	— 3	1	— 3
19 Other services	82	3	0	0	0	15
20 Government	100	0	0	0	0	0

(*) See footnote, table II.

FD — Final demand effects.
E — Exports.
M — Total import substitution effects.
MF — Final import substitution effects.
MM — Intermediate import substitution effects.
A — Technical coefficients.

In manufacturing, final demand relative effects were stronger than the average in the economy in apparel, shoe and leather (78.4 %) and wood, cork and furniture. Comparing with the previous subperiod, this move, in conjunction with the strength observed in construction and services, could be taken as evidence of consumer demand shifts in agreement with rising incomes.

From the vantage point of sectoral contributions to total final demand effects, services (21.8 %), outdistances any other sector, followed by metal-working (10.8 %), agriculture and fishing (10.1 %), food, beverages and tobacco (9.6 %) and apparel, shoe and leather (9.2 %). By comparison with the 1959-1964 period, trade and construction dropped out of the small group of sectors accouting for most of the final demand effects.

The late 60's confirmed the widening role played by foreign demand for ligth or resource based manufactures in the Portuguese industrialization.

TABLE V

Sectoral shares in output growth effects (1964-1970) (*)

Percentage

Sectors	*FD*	*E*	*M*	*MF*	*MM*	*A*
1 Agriculture and fishing	10.1	11.0	72.9	— 6.2	31.5	10.2
2 Mining	1.8	4.0	100.3	— 123.8	— 1.7	— 0.5
3 Food, beverages and tobacco	9.6	10.2	— 15.5	— 45.0	— 31.0	14.4
4 Textiles	— 1.0	14.7	34.7	19.1	26.5	20.1
5 Apparel, shoe and leather	9.2	9.4	— 33.2	22.9	— 3.9	0.9
6 Wood, cork and furniture	1.4	3.5	— 15.0	10.3	— 1.7	— 3.3
7 Pulp and paper	0.6	6.5	— 16.6	14.7	— 0.2	4.3
8 Chemicals	4.7	8.4	— 54.1	99.3	26.2	5.1
9 Petroleum and coal	0.7	3.1	13.3	— 6.9	9.9	— 0.7
10 Non-metalic mineral products	1.1	2.1	— 7.9	9.4	1.2	6.9
11 Basic metallurgy	1.2	2.6	36.6	— 46.4	— 6.8	3.4
12 Metalworking	10.8	14.0	30.1	36.7	33.5	16.1
13 Shipbuilding and repair	0.6	3.3	— 16.1	27.2	6.6	0.0
14 Miscellaneous manufacturing	2.3	3.7	— 30.9	33.5	2.8	9.0
15 Eleetricity, water and gaz	2.3	2.0	2.7	0.1	1.3	— 5.7
16 Construction	7.7	0.1	0.2	0.1	0.2	2.9
17 Trade	6.8	— 2.0	11.0	14.7	12.9	— 1.6
18 Transportation and communications	8.0	1.0	— 12.0	20.5	5.1	— 2.1
19 Other services	21.8	2.4	— 0.3	5.8	2.9	36.1
20 Government	4.1	0.0	0.0	0.0	0.0	0.0

(*) See note, table III.

FD — Final demand effects.
E — Exports.
M — Total import substitution effects.
MF — Final import substitution effects.
MM — Intermediate import substitution effects.
A — Technical coefficients.

The outstanding export led drive in this period has been centered on textiles; while in 1959-1964 exports represented the source of 46 % of sectoral output growth, in 1964-1970 they represented 74 %.

This upward trend also characterized other manufacturing sectors, which could take advantage of natural resources or labour availabilities. Food, beverages and tobacco, from — 3 % to 21 %, wood, cork and furniture, from 39 % to 55 %, and pulp and paper, from 38 % to 69 %, based their success on primary resources. The change in shipbuilding and repair, from — 66 % to 71 %, is explained by the start up of the huge LISNAVE ship repair facilities, manned by an adaptable and low paid, by international standards, labour force. The same advantage explains the wider role of foreign markets in metalworking output growth, which more than duplicated its relative contribuition, from 11 % to 24 %.

In three other sectors the need to gain economies of scale created temporary excess capacity which has been allocated to some extent to foreign markets. This happened in petroleum, chemicals and basic metallurgy. Export relative shares in sectoral growth have gone in the first case from — 8 % to 55 %; in the second case, from 38 % to 55 %, and in the third case, from 21 % to 38 %. Now, concerning the weight of each sector in total export growth, the outstanding position goes to textiles (14.7 %) and metalworking (14.0 %), followed by agriculture and fishing (11.0 %), food, beverages and tobacco (10.2 %) and apparel, shoe and leather (9.4 %).

Negative import substitumintion in final uses is the pervasive feature of the 1964-1970 evolution. Apart from the very hight percentual change in mining, significant positive import substitution in final use occurred only in the case of metallurgical products.

On intermediate uses, mild positive import substitution effects in several sectors reflect the development of basic industries initiated in the mid 50's and furthered in the 60's.

Changes in technical coefficients have been an important positive source for some sectors: textiles (38 %), non-metalic mineral products (31 %) and miscellaneous (24 %) are the clearest cases. On the other hand, the same source has shown to be noticeably negative in mining (— 21 %), wood, cork and furniture (— 19 %), basic metallurgy (— 18 %) and in trade (— 38 %). The first set of results needs to be researched further.

4.3 — **1970 - 1974**

In the early 70's domestic final demand reinforced its relative strength as a source of growth for every sector but for the export nucleous built around textiles, apparel and wood and cork activities.

The relative level in sectoral output growth exceeds 100 % in 9 out of 20 sectors and is between 85 % and 100 % in 5 others. In the remaining sectors domestic final demand represented between 40 % and 57 % of sec-

toral output growth. With the exception of petroleum, which has benefited from a broad, diversified support for output growth, the last group of sectors turned to export led growth.

The highest contributions to total final demand effects were found in trade (14.7 %), agriculture and fishing (12.8 %), metalworking (12.7 %), food, beverages and tobacco (11.2 %) and construction (10.5 %).

As already mentioned, export led growth prevailed in a few sectors which had already started their foreign demand orientation in earlier periods. The 1970-1974 developments only extended their commitment to such growth path. Exports were specially important as a source of growth in textiles (81 %), apparel, shoe and leather (80 %), wood, cork and furniture (65 %), pulp and paper (64 %) and shipbuilding and repair (93 %). In chemicals (59 %) and in basic metallurgy (54 %), excess capacity due to economies of scale help to explain export results.

TABLE VI

Sources of output growth (1970-1974) (*)

Percentage

Sectors	*FD*	*E*	*M*	*MF*	*MM*	*A*
1 Agriculture and fishing	113	18	— 34	21	12	2
2 Mining	104	121	— 153	— 131	— 22	28
3 Food, beverages and tobacco	117	16	— 25	— 17	— 7	— 8
4 Textiles	52	81	— 19	— 5	— 15	— 14
5 Apparel, shoe and leather	44	80	— 17	— 15	— 1	— 7
6 Wood, cork and furniture	57	65	— 5	— 4	— 1	— 17
7 Pulp and paper	48	64	— 2	1	— 3	— 9
8 Chemicals	103	59	— 46	— 15	— 31	— 15
9 Petroleum and coal	55	17	19	13	6	8
10 Non-metalic mineral products	101	11	— 1	3	2	— 12
11 Basic metallurgy	140	54	— 92	— 53	— 39	— 2
12 Metalworking	98	18	— 7	— 6	— 4	— 9
13 Shipbuilding and repair	40	93	— 9	— 9	0	— 25
14 Miscellaneous manufacturing	84	16	0	5	— 5	0
15 Electricity, water and gas	114	29	— 11	— 5	— 6	— 32
16 Construction	99	0	0	0	0	1
17 Trade	100	7	— 3	— 2	— 1	— 4
18 Transportation and communications	85	20	5	2	3	— 10
19 Other services	103	5	— 2	— 1	— 1	— 6
20 Government	100	0	0	0	0	0

(*) Apart from rounding errors, $FD + E + M + A = 100$ %.

FD — Final demand effects.
E — Exports.
M — Total import substitution effects ($M = MF + MM$).
MF — Final import substitution effects.
MM — Intermediate import substitution effects.
A — Technical coefficients.

TABLE VII

Sectoral shares in output growth effects (1970-1974) (*)

Percentage

Sectors	*FD*	*E*	*M*	*MF*	*MM*	*A*
1 Agriculture and fishing	12.8	8.7	— 31.7	34.1	28.2	— 4.2
2 Mining	0.5	2.5	— 6.2	0.9	2.1	— 2.4
3 Food, beverages and tobacco	11.2	6.3	— 19.9	23.6	14.6	13.1
4 Textiles	2.4	15.3	— 7.3	3.0	13.4	11.0
5 Apparel, shoe and leather	1.2	9.2	— 3.9	6.0	0.9	3.3
6 Wood, cork and furniture	1.5	7.3	— 1.2	1.6	0.6	7.8
7 Pulp and paper	0.9	4.9	— 0.4	— 0.4	1.4	3.0
8 Chemicals	3.6	8.5	— 13.3	7.6	21.5	9.1
9 Petroleum and coal	2.4	3.0	6.9	— 8.3	— 5.0	— 6.4
10 Non-metalic mineral products	2.4	1.1	0.1	— 0.9	0.9	5.1
11 Basic metallurgy	1.7	2.8	— 7.9	9.2	9.8	0.5
12 Metalworking	12.7	10.0	— 7.8	10.8	3.6	20.3
13 Shipbuilding and repair	0.6	5.6	— 1.1	1.8	0.0	6.1
14 Miscellaneous manufacturing	3.0	2.3	0.1	2.5	3.4	— 0.1
15 Electricity, water and gas	1.4	1.5	— 1.2	1.0	1.5	6.7
16 Construction	10.5	0.2	— 0.2	0.2	0.2	— 1.4
17 Trade	14.7	4.6	— 3.6	3.6	3.6	10.9
18 Transportation and communications	4.1	4.0	0.2	— 1.6	— 2.5	8.1
19 Other services	9.6	2.1	— 1.9	1.9	1.8	9.4
20 Government	2.8	0.0	0.0	0.0	0.0	0.0

(*) See note, table III.

FD — Final demand effects.
E — Exports.
M — Total import substitution effects.
MF — Final import substitution effects.
MM — Intermediate import substitution effects.
A — Technical coefficients.

A sizeable proportion of total export growth has been due to textiles (15.3 %), apparel, shoe and leather (9.2 %) and metalworking (10.0 %); the latter in spite of its relative orientation in favour of the domestic market.

Import substitution in final uses has been a well established trend of the late 60's. The early 70's not only fully confirmed its acceleration but also they have seen a similar movement installed in intermediate uses. Negative import substituition in final uses has been strong even in sectors where Portugal is usually supposed to enjoy unchallengeable comparative advantage, as in apparel, shoe and leather (— 15 %). Another area which deserves to be mentioned, though unsurprisingly, is agriculture and fishing (— 21 %) and food, beverages and tobacco (— 17.5 %).

Regarding intermediate uses, the almost universal result has been negative import substitution. The most serious relative development concerns basic metallurgy (— 39 %) and chemicals (— 31 %) but textiles (— 12 %) and agriculture (— 15 %) should also be mentioned.

Changes in technical coefficents have also been a negative source of growth for the 16 out of 20 sectors. This is in line with what we might expect.

5 — Private consumption, Government consumption and investment expenditures as sources of growth

Final demand changes have been the dominant source of growth in any of the subperiods. As already stated (table I), the record shows that they provided for 85 % of total growth in 1959-1964, 71 % in 1964-1970, and 94 % in 1970-1974. Now, we are going to examine the decomposition of final demand changes into three components, that is, private consumption, Government consumption and investment changes.

Table VIII shows the impact of each of these sources in total output growth in the economy from 1959-1974.

TABLE VIII

Decomposition of final demand changes as sources of total output growth (1959-1974)

Percentage

	1959-1964	1964-1970	1970-1974
Final demand	85.1	70.8	94.2
Private consumption	51.3	52.4	55.6
Government consumption	10.5	2.3	4.7
Investment	23.3	16.2	33.9

The results obtained provide valuable insights into the consequences of economic policies followed in the 60's and early 70's.

Firstly, to accomodate the resources mobilization for military use, following the outbreak of guerilla warfare in the three African colonies — Angola, Mozambique and Guiné —, Government consumption and investment growth rates have been severely reduced in the second half of the 60's. This explains the drop of final demand changes share in total output growth from 85 % in 1959-1964 to 71 % in 1964-1970.

TABLE IX

Private consumption, Government consumption and investment effects (1959-1964)

Percentage

Sectors	Total final demand	Final demand		
		Private consumption	Government consumption	Investment
1 Agriculture and fishing	113	88	0	25
2 Mining	104	38	3	62
3 Food, beverages and tobacco	117	102	0	15
4 Textiles	52	35	— 3	20
5 Apparel, shoe and leather	44	40	— 5	9
6 Wood, cork and furniture	57	22	1	34
7 Pulp and paper	48	30	1	16
8 Chemicals	103	53	1	48
9 Petroleum and coal	55	38	1	16
10 Non-metalic mineral products	101	18	0	82
11 Basic metallurgy	140	47	12	81
12 Metalworking	98	40	11	47
13 Shipbuilding and repair	40	5	5	31
14 Miscellaneous manufacturing	84	67	4	12
15 Electricity, water and gas	114	72	12	30
16 Construction	99	2	0	97
17 Trade	100	61	2	37
18 Transportation and communications	85	81	1	4
19 Other services	103	97	1	5
20 Government	100	0	100	0

In relative terms, private consumption impact has been slightly increased in comparison with the first subperiod share but Government consumption dropped 8 points, from 10.5 % to 2.3 %, and the investment share declined by 7 points, from 23.3 % to 16.2 %.

Secondly, in the early 70's the private consumption share continued to experience an increase of 55.6 %, while the investment share has peaked to 34 %. Simultaneously, there was a recuperation of Government consumption to 4.7 %, of scant significance, having in mind that in 1959-1964 its share had already attained the 10.5 % mark.

Concerning the sectoral evolution (tables IX, X and XI) for most activities, the key source of growth lied in private consumption increases.

The few exceptions belong to two different categories. In the first category we find a group of sectors influenced by changes in fixed capital formation, apart from fluctuations in inventories: basic metallurgy, metalworking, shipbuilding and repairing and construction.

The second category is formed by two sectors, chemicals and wood, cork and furniture, both characterized by relatively balanced contributions originated in private consumption and investment.

It is also interesting to note that agriculture and trade output growth, although primarily geared to changes in private consumption, also reflect to a certain extent investment growth effects.

Now, we must turn our attention to the role of Government consumption. Predictably enough, after having been a modest source of growth in 1959-1964, it did turn out to be a negative factor for almost every sector in the following years, up to 1970. This is what one could expect out of changes in public consumption in line with the budgetary policies that followed the outbreak of guerilla warfare. Sectoral improvements in 1970-1974 have been of a very moderate nature.

Concerning the sectoral structure of disaggregated final demand effects (tables XII, XIII and XIV), the following facts deserve to be mentioned. Private consumption effects are mostly due to accrued demand for four types of suppliers of basic requirements.

TABLE X

Private consumption, Government consumption and investment effects (1964-1970)

Percentage

Sectors	Total final demand	Final demand		
		Private consumption	Government consumption	Investment
1 Agriculture and fishing	66	81	— 2	— 12
2 Mining	— 686	49	— 15	— 720
3 Food, beverages and tobacco	68	73	— 2	— 2
4 Textiles	— 18	— 30	5	7
5 Apparel, shoe and leather	78	76	1	1
6 Wood, cork and furniture	72	42	— 9	39
7 Pulp and paper	20	14	— 2	8
8 Chemicals	65	36	— 1	30
9 Petroleum and coal	42	44	— 3	1
10 Non-metalic mineral products	46	— 11	— 7	65
11 Basic metallurgy	62	24	— 3	41
12 Metalworking	64	13	1	50
13 Shipbuilding and repair	41	34	— 4	11
14 Miscellaneous manufacturing	57	45	1	10
15 Electricity, water and gas	65	52	5	8
16 Construction	104	4	— 9	109
17 Trade	148	97	— 4	55
18 Transportation and communications	101	100	0	1
19 Other services	82	78	1	3
20 Government	100	0	100	0

TABLE XI

Private consumption, Government consumption and investment effects (1970-1974)

Percentage

Sectors	Total final demand	Final demand		
		Private consumption	Government consumption	Investment
1 Agriculture and fishing	108	71	5	32
2 Mining	318	6	21	290
3 Food, beverages and tobacco	90	84	1	4
4 Textiles	71	72	0	— 2
5 Apparel, shoe and leather	69	67	1	0
6 Wood, cork and furniture	80	35	7	38
7 Pulp and paper	35	26	4	5
8 Chemicals	67	72	3	— 8
9 Petroleum and coal	107	143	— 34	— 1
10 Non-metalic mineral products	99	36	11	52
11 Basic metallurgy	63	16	8	39
12 Metalworking	68	27	5	35
13 Shipbuilding and repair	746	141	— 1	606
14 Miscellaneous manufacturing	259	216	11	33
15 Electricity, water and gas	77	57	10	10
16 Construction	98	4	10	85
17 Trade	67	42	3	21
18 Transportation and communications	58	50	4	4
19 Other services	104	100	2	2
20 Government	100	0	100	0

The first type comprises food in a broad sense. Agriculture and fishing and food, beverages, and tobacco benefited from consumptions effects at the tune of 1/3 of such effects in 1959-1964 and 1970-1974 and a little less in 1964-1970.

The second type concerns textiles and apparel and shoe and leather, both with a somewhat erratic behaviour. Taking together those two sectors, their share in the three subperiods has been, respectively, 17 %, 9.5 % and 4.6 %.

The third type is represented by trade and services with values around 30 % in 1959-1964 and 1970-1974, but 34 % in 1964-1970. However, while in the beginning ar.. in the end subperiods their relative shares have been quite similar, in the middle subperiod trade had no more than 6 % and services peacked to a 28 % share.

The above mentioned discrepancies have to be pursued in detail, in order to find a suitable explanation for them.

Government consumption effects are documented by the Government sector itself, thus reflecting the national accounts conventions adopted. Finally, regarding investment, there are two sectors which are the main beneficiaries of those effects: construction, with a share varying from 38 % in the initial subperiod to 29 % in the final period, and metalworking, with a maximum of 37 % in the middle subperiod and a minimum of 12 % in the initial one. These two opposed changes are, to some extent, explained by the rising share of equipment in gross fixed capital formation as the structure of the economy grows in complexity. Apart from that, we must mention that trade has twice reached the 15 % mark in the initial and final periods and agriculture has once attained the share of 11.5 % in 1959-1964. Also chemicals, non-metallic mineral products and basic metallurgy usually account, individually, for more than 5 % of investment effects.

TABLE XII

Sectoral shares in disaggregated final demand effects (1959-1964) (*)

Percentage

Sectors	Total final demand	Final demand		
		Private consumption	Government consumption	Investment
1 Agriculture and fishing	10.7	11.6	4.1	11.5
2 Mining	1.4	0.0	0.7	4.6
3 Food, beverages and tobacco	14.8	23.0	1.3	2.7
4 Textiles	6.1	10.4	0.4	— 0.7
5 Apparel, shoe and leather	4.1	6.6	0.7	0.0
6 Wood, cork and furniture	2.5	1.8	1.9	4.3
7 Pulp and paper	0.8	1.0	0.7	0.4
8 Chemicals	3.4	6.0	1.4	— 1.5
9 Petroleum and coal	— 0.8	— 1.9	2.2	0.0
10 Non-metalic mineral products	2.8	1.7	2.5	5.3
11 Basic metallurgy	2.2	0.9	2.2	5.1
12 Metalworking	6.1	4.1	4.0	11.7
13 Shipbuilding and repair	0.6	0.2	0.0	1.9
14 Miscellaneous manufacturing	1.1	1.5	0.4	0.5
15 Electricity, water and gas	2.0	2.4	2.1	0.9
16 Construction	12.2	0.7	9.8	38.5
17 Trade	13.0	13.6	5.4	15.1
18 Transportation and communications	3.4	4.8	2.0	0.9
19 Other services	8.9	14.3	1.1	0.6
20 Government	7.1	0.0	57.5	0.0

(*) See footnote, table III.

TABLE XIII

Sectoral shares in disaggregated final demand effects (1964-1970) (*)

Percentage

Sectors	Total final demand	Final demand		
		Private consumption	Government consumption	Investment
1 Agriculture and fishing	10.1	16.7	— 11.4	— 8.3
2 Mining	1.8	0.2	— 1.3	— 8.4
3 Food, beverages and tobacco	9.6	13.8	— 7.8	— 1.6
4 Textiles	— 1.0	— 2.4	10.5	1.8
5 Apparel, shoe and leather	9.2	11.9	5.4	0.7
6 Wood, cork and furniture	1.4	1.1	— 5.8	3.2
7 Pulp and paper	0.6	0.5	— 2.3	1.0
8 Chemicals	4.7	3.5	— 2.5	9.4
9 Petroleum and coal	0.7	1.0	— 1.6	0.1
10 Non-metalic mineral products	1.1	— 0.4	— 5.4	6.9
11 Basic metallurgy	1.2	0.7	— 2.1	3.5
12 Metalworking	10.8	2.9	4.2	37.0
13 Shipbuilding and repair	0.6	0.6	— 1.8	0.7
14 Miscellaneous manufacturing	2.3	2.5	1.9	1.8
15 Electricity, water and gas	2.3	2.5	6.0	1.3
16 Construction	7.7	0.4	— 23.2	35.5
17 Trade	6.8	6.0	— 5.7	11.0
18 Transportation and communications	8.0	10.7	— 0.6	0.4
19 Other services	21.8	27.9	8.7	4.0
20 Government	4.1	0.0	134.9	0.0

(*) See footnote, table III.

TABLE XIV

Sectoral shares in disaggregated final demand effects (1970-1974) (*)

Percentage

Sectors	Total final demand	Final demand		
		Private consumption	Government consumption	Investment
1 Agriculture and fishing	12.8	16.8	— 0.3	7.9
2 Mining	0.5	0.3	— 0.3	0.8
3 Food, beverages and tobacco	11.2	16.6	— 0.4	4.0
4 Textiles	2.4	2.7	— 2.7	2.6
5 Apparel, shoe and leather	1.2	1.9	— 2.5	0.7
6 Wood, cork and furniture	1.5	1.0	0.5	2.6
7 Pulp and paper	0.9	1.0	0.4	0.8
8 Chemicals	3.6	3.1	0.6	4.7
9 Petroleum and coal	2.4	2.8	1.1	1.9

Sectors	Total final demand	Final demand		
		Private consumption	Government consumption	Investment
10 Non-metalic mineral products	2.4	0.8	— 0.1	5.5
11 Basic metallurgy	1.7	1.0	3.0	2.8
12 Metalworking	12.7	8.8	28.9	16.9
13 Shipbuilding and repair	0.6	0.1	1.3	1.1
14 Miscellaneous manufacturing	3.0	4.0	2.9	1.2
15 Electricity, water and gas	1.4	1.5	2.9	1.0
16 Construction	10.5	0.3	0.9	28.6
17 Trade	14.7	15.2	4.7	15.2
18 Transportation and communications	4.1	6.6	0.5	0.5
19 Other services	9.6	15.4	2.0	1.2
20 Government	2.8	0.0	55.9	0.0

(*) See footnote, table III.

6 — **Conclusions**

According to the Torii-Fukasaku methodology, private consumption changes have been the dominant source of output growth in every subperiod. Moreover, its share rose consistently along the period.

Other components of final demand, namely Government consumption, fully reflected the consequences of resources mobilization in response to Salazar and Caetano's colonial war policies. Investment uses, although severely affected in the mid 60's, increased their importance in the early 70's.

The report has also shown that movements towards a much more open economy have to be evaluated taking into account both export and import substitution effects. In the 60's, and on an aggregated basis, the overall balance improved at a reasonable pace. Its share in total output growth increased from 18.1 % in 1959-1964 to 21.5 % in 1964-1970, both aggregate exports and import substitution effects being positive.

However, in 1970-1974 the net foreign effects experienced a sharp drop, to 11.2 %. In this subperiod, aggregate import substitution effects varied from little less than + 1 % in the 60's to — 11.3 %. Although export effects have always increased in every subperiod, the most interesting point for further research lies probably on the import substitution side.

A comment is also in order, regarding methodology. Other methods of measurement are available. To what extent will the broad picture change if we apply alternative methods? Finally, what can we gain if we take a finer sectoral detail?

The above mentioned aspects will be reported in other papers.